

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/BR2005/000048

International filing date (day/month/year)
11.04.2005

Priority date (day/month/year)
12.04.2004

International Patent Classification (IPC) or both national classification and IPC
F04B39/02, F16C39/06

Applicant
EMPRESA BRASILEIRA DE COMPRESSORES S.A. - EMBRACO

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/BR2005/000048

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/BR2005/000048

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	

Inventive step (IS)	Yes: Claims	2-13
	No: Claims	1

Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1 : US 2001/010438 A1 (BOUILLE ANDRE ET AL) 2 August 2001 (2001-08-02)

D2 : US 6 464 472 B1 (SEKIGUCHI SHINICHI ET AL) 15 October 2002 (2002-10-15)

D3 : US 2002/050424 A1 (IVERSEN FRANK HOLM ET AL) 2 May 2002 (2002-05-02)

D4 : US 5 924 847 A (SCARINGE ET AL) 20 July 1999 (1999-07-20)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3)PCT.

2.1.1 Document D1, which is considered to represent the most relevant state of the art to the subject matter of claim 1, discloses

A magnetic axial bearing arrangement that comprises at least one magnetic axial bearing assembly (100) composed of magnet elements (101) with mutually confronting faces, each magnet element (101) being mounted to a respective part of at least one of the pairs of parts of crankshaft (50) and cylinder block (20) and of cylinder block (20) and rotor (61), there being provided, in at least one of the pairs of parts, confronting mechanical stops which are maintained spaced apart by an axial gap (FA) smaller than a magnetic axial gap (FM) existing between the confronting faces of the magnet elements in order to guarantee that, upon occurring at least one of the conditions of a sufficiently high increase of the compressor temperature and an axial displacement of said parts during transportation of the compressor causing the mutual seating of the confronting mechanical stops, the magnetic axial gap is maintained higher than zero (see document D1 and the corresponding passages cited in the search report).

2.1.2 The subject-matter of independent claim 1 differs from the disclosure of D1 in that:
the magnetical axial bearing is used in a hermetic compressor as the one disclosed in D3.

2.1.3 The problem to be solved by the present invention may therefore be regarded as to guarantee that, upon occurring at least one of the conditions of a sufficiently high increase of the compressor temperature and an axial displacement of the parts during transportation of the compressor causing the mutual seating of the confronting mechanical stops, the magnetic axial gap is maintained higher than zero.

2.1.4 The problem to be solved is the same as in D1. Therefore the features disclosed in D1 and D3 would be combined by the skilled person, without exercise of any inventive skills in order to solve the problem posed. The proposed solution in independent claim 1 thus cannot be considered inventive (Article 33(3) PCT).

2.1.5 For analogous reasons, the subject matter of claim 1 does not involve an inventive step over the following documents combinations:
D2 and D3
D3 and D4

3. Further, the expression:

"A magnetic axial bearing arrangement in a reciprocating hermetic compressor, comprising:" used in claim 1, lines 1-2 is vague and indefinite (Article 6 PCT). Due

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/BR2005/000048

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A hermetic compressor comprising (...).

The claims should therefore be redrafted accordingly.

Such a reformulation could render the subject matter of claim 1 new and inventive.